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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,246	10/30/2000	Dengwei Fu	1997.0010002	6241

7590 05/17/2006

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EXAMINER

DO, CHAT C

ART UNIT PAPER NUMBER

2193

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/698,246	FU ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-57, 60-61, and 66-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 8-34, 46-53, 66, 67, 69, 71, 72 and 75-78 is/are allowed.
- 6) ☒ Claim(s) 35-45, 54-57, 60, 61, 68, 70, 73, 74, 79 and 80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to Amendment filed 04/17/2006.
2. Claims 1-4, 8-57, 60-61, and 66-80 are pending in this application. Claims 1, 9, 16, 26, 35, 45-46, 48, 50, 52-54, 56, and 60-61 are independent claims. In Amendment, claims are 5-7, 58-59, 62-65 cancelled and claims 74-80 are added. This Office Action is made final.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 35-45, 54-57, 60-61, 68, 70, 73-74, and 79-80 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 35-45, 54-57, 60-61, 68, 70, 73-74, and 79-80 clearly recite a method for performing an angle rotator according to a mathematic algorithm. In order for such a claimed method to be statutory, the claims must include either a practical application at useful end or a discrete, useful, and tangible result. However, it is clear from the claims that the claims merely recite step or non-specific means for data computation and manipulation in performing a mathematical function. The claims are pure mathematical abstract idea. The input is a number and output is also a number. Therefore, claims 35-45, 54-57, 60-61, 68, 70, 73-74, and 79-80 are clearly directed to a non-statutory subject matter.

Allowable Subject Matter

5. Claims 1-4, 8-34, 46-53, 66-67, 69, 71-72, and 75-78 are allowed.
6. The following is an examiner's statement of reasons for allowance:

The prior art of records fails to disclose or render an obviousness of an angle rotator for rotating an arbitrary input complex number given an input angle comprising: a memory that stores a sine and cosine of θ_M ; a first digital circuit performs coarse rotation on the complex number using sine and cosine of θ_M ; and a second digital circuit that performs a fine rotations on the output of first digital circuit using fine adjustment angle as $\theta - \theta_M$ as cited in independent claims 1, 9, 16, 48, and 50; or using $\tan \theta_M$ and $\cos \theta_M$ as cited in independent claims 26, 46, and 52; or generate a normalized input angle, determining whether it is in an even or odd quadrant or octant, selectively performing a 2's complement negate operation as cited in independent claim 53.

The closest found prior arts are Naofumi et al. ("Redundant CORDIC methods with a constant scale factor for Sine and Cosine computation") and Fox et al. (U.S. 5,276,633). Naofumi et al. in view of Fox et al. disclose a method of rotating a angle given an input angle. However, Naofumi et al. in view of Fox et al. fail to disclose implicitly a method of rotating an arbitrary input complex number comprising a memory for storing sine and cosine values for performing a coarse and fine adjustment as cited above.

Response to Arguments

7. Applicant's arguments filed 04/17/2006 have been fully considered but they are not persuasive.

a. The applicant comments in page 24 for claims rejected under 101 that the amended claims by inserting a step that processing a signal by the digital device wherein the rotated complex number is used to generated signal.

The examiner respectfully submits that the current amended claim language does not overcome the rejection under 101 because generally it does not include either a practical application at useful end or a discrete, useful, and tangible result. The claims purely disclose a method of generating a rotated complex number.

Further, the single coordinate output is used during said processing would not provide any practical application at useful end or a discrete, useful, and tangible result because the single coordinate output might or might not use with the processing signal but rather it is just used in parallel with the processing digital device.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2193

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

May 6, 2006



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